

Abstract of the Disclosure

A gasoline direct injection system of an engine has a high pressure pump with an output connected to a fuel rail that supplies a plurality of fuel injectors. A control valve is connected in parallel with the pump to maintain the fuel rail pressure at a consistent level as the fuel injectors open and close. A valve element engages and disengages a seat to control the flow of fuel through the control valve. The high pressure from the fuel supply rail acts on surfaces of the valve element which are designed to produce a force imbalance that serves to rapidly open the control valve. An electromagnetic actuator, that closes the control valve, has a low impedance coil and pole pieces made of soft magnetic composite material to minimize eddy currents that impede valve performance.